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THE DEVELOPMENT OF THE HOUSE[1]

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Ever since home economics began to be studied, we have been trying to develop an intelligent standard of living and we have been trying to fit this new scheme of things into houses that were never designed to take it. Consequently there has been a good deal of friction and lost motion. The struggle with imperfect dwellings has clogged our courses in sanitation and household management with much material that is in the end nothing more than a fresh patch on an old sore. Clearly this is not the final method of solution for an educational program on the house. So it has been found necessary to approach the problem the other way round; to base the development of the house on the new scheme of things, so that it shall be a true expression of our social, economic, and artistic needs.

Since houses are intended to live in, the conception of the house must take its cue from our conception of living, the form must fit the function. It would seem then, that to arrive at an intelligent understanding of the house, we must begin with a sort of theory or philosophy of the house as a background, just as we must have a sort of philosophy concerning food and concerning clothing. This means that our house unit must be capable of analysis, of organization, and of enhancement. We must be able to think in terms of a theoretical house before we can think safely in terms of an actual house. We must be able to think in

[1] Presented at the Ninth Annual Meeting of the American Home Economics Association, Ithaca, N. Y., 1916.

terms of space, of floor areas, of arrangement and of proportion, before we can safely think in terms of rooms. Matters of cost and details of planning are of minor importance in developing a house intended to be theoretically sound in principle. Economic and aesthetic considerations of a broad nature should be the governing factors.

If we think of the house, not as rooms, but as an enclosed space, we find ourselves wondering as to the amount of this space, its general proportions, and its disposition for use into smaller parts. In other words we are faced with certain mass considerations of size, of shape, and of arrangement.

It is with these mass considerations that our theory of the house should begin.

Take for example the matter of size. Here the needs and means of the family are the chief factors to be considered. Theoretically what is wanted in any case, is an economic answer to the problem: an amount of space greater than which would involve waste and less than which would involve friction. Although it is easier to describe this efficiency area than it is to find it, it can nevertheless be approximated from several sources.

Usually the amount of sleeping accommodation needed will be a guide. Thus if one knows that three bedrooms, bath, and hall can be developed within a minimum area of from 700 to 800 square feet, and that four bedrooms, bath, and hall can be developed within a minimum area of from 800 to 1000 square feet, one concludes that, based merely on the sleeping space item, a family of from two to six persons can be comfortably housed in a two story dwelling having from 700 to 1000 square feet of space on a floor. More area will bring larger or more rooms.

The limiting cost of the dwelling is also a guide to its size. Thus, if a house of given standard in a given locality costs a certain amount per cubic foot, and a man has a fixed sum to spend, he can find out before starting to plan his house just how much cubic space he can buy with his money.

The marketability of property also somewhat affects the size of house that is built. It has been found that in most localities, houses with four or more bedrooms are more marketable than those with two or three.

Thus out of a discussion of the various factors that bear upon the general size of dwellings, one forms at length an intelligent conception of what is relatively a small house, or relatively a large house; of about what accommodation a house of given size should afford or about what

is the minimum size for a given problem. This background conception of size gives one a sense of scale and values, and serves as a check on crowded or wasteful planning. While in no sense a rule, it becomes, for the time being, the typical case or standard of measurement for size.

In a similar manner the mass shape or form of the house may be analyzed. Thus the square house, the slightly rectangular house, the long house, and the angular or T-shaped house have each their own statement to make concerning the cost of building and upkeep, and concerning the general design. Here we find the first cost, the upkeep, and the paths of travel to be least in the perfectly square plan, increasing constantly as the differences in proportion increase and becoming greatest in various forms of angular plans. But however economical the square plan, it is a stupid type to design; while rectangular and irregular forms are both more designable and more picturesque when built.

Out of this analysis and a discussion of such features as height and manner of roofing, one forms at length a comprehension of mass form as affected by economic and artistic considerations.

As concerns the subject of mass arrangement, we turn at once to an organization of space that shall correspond to an organization of house activities. These may be broadly classed into three groups: work, recreation, and complete rest; hence the house space may be correspondingly organized into three groups, working area, recreative or living area, and sleeping area. While in reality these three groups merge and overlap, theoretically, at least, this brings three clear-cut divisions of space, each of which is distinct in use, in arrangement, in decorative character, and in furnishing or equipment.

According to this arbitrary division, the working area should provide for those specific forms of labor that are necessary to the physical life of the household. To this area belong kitchen, pantry, laundry, stairs, and passage, and whatever storage or porch space is needed to complete the usefulness of these parts. Since, owing to the nature of the work, the worker must walk or stand most of the time, limited space, short paths of travel, and convenience of tools are important. As regards decoration, with the possible exception of the stairs, the working parts should be light colored, with clean, washable surfaces, and should be furnished preferably with fixed equipment. In plan, the salient characteristic of the working area should be compactness.

The living area should provide for interests of a recreative, hospitable, or studious nature. To this area belong entrance hall, living and dining

room, library, study or den, and whatever storage or porch space is needed to complete the usefulness of those parts. Owing to the leisurely nature of its use, the living space should be generous in layout and both restful and decorative in general effect. In plan, the salient characteristics of the living area should be spaciousness.

The sleeping area should provide for those needs that are connected with personal bodily rest or refreshment. To this area belong bedroom, dressing room, bath, hall and whatever storage or porch space is needed to complete the usefulness of this group. Owing to the nature of its use, the sleeping space should be light, airy, retired, and intimate in its parts. In plan the salient characteristics of the sleeping area should be privacy.

Thus the organization of the plan into functional areas furnishes the clue not only for the arrangement of the house, but for the decoration and furnishing as well.

It will be found upon further investigation that these areas bear a certain flexible relation to each other in various types of dwellings: thus the proportion of the working space to living space is least in the apartment and greatest in the farmhouse, varying from about 10 to 50 per cent, with the suburban dwelling about half-way between. Or comparing the sleeping space to the other areas we find that in a normal two story house, the sleeping area is equal to the sum of the living and working areas. Or, conversely, if the sleeping requirement is small or is less than the sum of these areas, or if it is relatively greater than the sum of these areas, we have a clue as to the relative possibilities of one, two, or three floor developments, which helps us to interpret the case of the bungalow, apartment, cottage, or large residence.

Going still further it will be found that each subdivision, unit, or room in each area can likewise be examined and interpreted. Thus the functions of size and location of the hall and stairs can be discussed in a general and detailed way. Thus also may be discussed the relative size, proportion and inter-communication of the living rooms, the meaning of axes and vistas, the relation of wall spaces and openings. Thus also may be analyzed the essential elements of the compact working area and the private sleeping area.

After one has acquired a theoretical grasp of the subject of the house, definite problems in planning may be undertaken. Here the individuality of the house comes into play. The development of a house to suit a given site, a given family, or a given cost, introduces factors that give variation to each problem, so that each house should have an individual

solution. Of these factors, that of site should always be considered, for while people move from place to place, houses do not. Therefore, from the start, a dwelling should be made to partake of a character peculiar and fitting to the spot on which it stands.

It is not enough that a house shall be sound in principle. It should be individual in design as well. It should have style, personality, and decision, both inside and out. Design in houses corresponds to individuality or personal magnetism in people. It is that quality which sets it apart from its fellows or lifts it out of its type. By force of its design, a house expresses itself. It says something individual about the family or its site. It makes appropriate remarks about sunlight, view and garden, about vistas and proportions. Its function is to strengthen and to enhance.

To the claims of exterior design the American people as a whole have been sadly unresponsive. In general, if houses have been convenient and livable within, it has sufficed. The result has been an epidemic of hard, unblinking structures, mere practical statements of shelter, utterly lacking in style and charm. Public taste has naturally been stupefied by the mere frequency of such unlovely models. The time has come when it should be the obligation of every property owner to attend to the aesthetic aspects of his place. It should be a matter of common acceptance that no man has a right to own property until he can afford to consider more than its commercial value.

But a true conception of the house demands not only that a dwelling be well-planned and well-designed; it must also be soundly built. This implies an understanding of construction and a comprehension of the nature and use of building materials. An educational program which is considering construction should not confine itself to the practical details of building, but should examine new materials and detect their influence on the whole trend of building. Instead of being content with knowing how to finish and care for wood floors, we should rather inquire whether wood is a reasonable material for floors. To be sure it is claimed that it is easy to walk on but it is we who do the walking, not the floor; so if we can find a durable material requiring less care, we had better put the wear on the people instead of the floor: we had better rubber-heel the world. How about the whole nature of wood? What is its normal use? How is it abused? How about frame houses and the problem of forest preservation? Is not the timber house already economically a thing of the past—considering upkeep, insurance,

and deterioration through a term of years? What is the significance of these new clay and concrete products? What their value to the coming generation? How will they affect the design, the upkeep, and the care of dwellings? It is better to discuss such themes with students than to fix in their minds the details of doors, windows, and the like, unless it can be made clear to them that these are but illustrations of the principles of construction in general.

The regulation of personal property is not, however, our whole responsibility. We should learn to mentally scour the field, and catch the trend of housing manifestations in the aggregate. We should learn to comprehend the significance of community schemes of planning; to understand that the erection of multiple dwellings, whether apartments, flats, tenements or two story dwellings, has a peculiar significance for the people of that community; to see the connection between housing and town planning and to detect and forestall problems of housing wherever a network of conditions brings them into play. As women who are to guide the homemaking population of the future, we should be in the van of every movement which aims at wholesome housing, not only for ourselves but for the whole population.

WHY THE LARGE CALORIE?

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The use of the metric system in scientific work with its definite names for the multiples and sub-multiples of the units, has become almost universal. The gram with the milligram and kilogram, the meter with the centimeter and kilometer, and the liter with the kilo-liter are familiar terms to everyone.

The physicist in making use of the metric terms in defining the physical units has without exception accepted the recognized names for the multiples and sub-multiples of these units. The gram-centimeter as a unit of work has for its multiple, not the *large* gram-centimeter, but the kilogram-meter. This practice enables the student to see readily the magnitude relation between the two units and avoid any possible misunderstanding as to the particular magnitude used.

Among the units for quantity of heat, the calorie has long had, to the physicist, a definite and single meaning. If the numerical value for the amount of heat is large, he has expressed the amount in ***kilo-calories***, or sometimes, in calories multiplied by the factor 10 raised to the proper power, as 45.6×10^3 calories.

For reasons that are unknown, at least to the writer, some branches of science have departed from the recognized and accepted names for the metric unit and have come to use the expression "large calorie" for the unit of quantity of heat 1000 times greater than the calorie. The correct term, kilo-calorie, is seldom or never used. Having selected an odd name for the kilo-calorie, the writers proceed along two absolutely contradictory lines to inform the unfortunate reader how the distinction is to be made between the calorie and the kilo-calorie or large calorie. The quotations which follow will clearly show this.

> For measuring the heat value of foods, one employs, for convenience, the *large* calorie, i.e., the amount of heat required to raise 1 kilo of water 1°C., and one writes it *Calories with a capital C.* (Hutchison, Food and Dietetics, p. 4.)

This use of the capital C is evidently to be a short hand device for the longer expression, kilo-calorie or large calorie, and seems satisfactory until the reader comes across the following:

> They assume that the food requirement of 100 men, women, and children is the same as that of 77 "men." Therefore each "man" received *4000 calories daily* . . . . . (Lusk, Food Values, *Science*, April 13, 1917.)

In view of the statement above we rather naturally assume that the 4000 calories mentioned do not mean large calories, and so come to wonder if it is an anti-fat diet that is being discussed.

Again, let us get our information concerning the unit for the quantity of heat from the following:

> Since the measure for heat is a calorie, or the quantity of heat required to raise 1 liter of water 1°C., etc. (Lusk, Fundamental Basis of Nutrition, p. 6.)

This definition leads us to assume that evidently there is only one *calorie* after all, and hence there is no need whatever to try to distinguish between it and another non-existing unit. Just as we are getting

convinced that we cannot make any mistake since the word calorie has but one meaning, we read in a footnote:

> When the term "calorie" is used in this work, it will be understood to mean the greater calorie. (Sherman, Chemistry of Food and Nutrition, p. 121.)

Evidently there are two calories after all, and they may sometimes be distinguished by using a capital C for the larger one or by using a small c and adding a foot-note calling attention to the fact that the word calorie as used does not mean the calorie at all, but always a unit 1000 times larger.

Finally, a worker in those branches of science that permit this loose use tells us that we are to pay no attention to capital or small C but to keep in mind this simple fact: The only calorie that is used by us is the large calorie, and so any uniform or special designation is unnecessary. We see at last the end of our confusion and uncertainty. We therefore, at first, read with no question the statement in Vegetable Proteins, by Osborne, that *glutenin* from wheat has a fuel value of 5543 calories per gram. Somehow, there comes into our minds the fact that hydrogen, which has the highest fuel value of all substances, is credited with but 34 of our undistinguished, non-capitalized but large calories. We now give up in despair.

The writer's experience as a teacher of physics with over two hundred junior students of home economics has fully convinced him that the great majority of students are seriously confused by the present loose use of the term calorie. He wants to know if there is any valid reason for the expression "large calorie" with its seemingly uncertain designation. Why should not the term kilo-calorie always be used when a heat unit 1000 times the calorie is meant?

If there is no valid reason for keeping the present indefinite term or for not using the definite and orthodox kilo-calorie, will not teachers of home economics insist on the use of the kilo-calorie in all of their work? The reform would be started and the poor physicist when he visits a standard ration exhibit and sees a placard, "this is a 100 calorie portion," would no longer be in doubt whether to select a half dozen of them for his lunch or, not being very hungry, to order only four or five thousand portions.

A DESIRABLE CHANGE IN THE TEST FOR SILK AND WOOL

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When testing for the presence of cotton in wool materials, the average class in textiles uses the KOH test as given in such standard texts as Matthews' Textile Fibers, Dannerth's Methods of Textile Chemistry, or Woolman and McGowan's Textiles. The directions for the experiment in each of these texts state that the sample to be tested should be boiled for fifteen to twenty minutes in a 5 per cent KOH solution, keeping the volume of the solution constant by using a reflux condenser. If the test is quantitative, then a correction of 3 to 5 per cent of its weight is added to the weight of the cotton residue in order to make up for any loss in weight which the cotton may suffer in the long boiling in the KOH solution. When following these directions it is always very evident that the wool is destroyed a number of minutes before the expiration of the time allowed for the reaction, and the question naturally arises whether the same concentration of KOH solution could not be used for a shorter period of time, or a more dilute solution for the same period of time, and if these changes were made, what effect they would have on the loss in weight of the cotton residue.

A study[1] was made on the first phase of this question, and experiments, carried on to determine whether a 5 per cent solution of KOH would not destroy wool and silk in a shorter period of time. Fifty tests each were made with samples from six all wool fabrics and six wool and cotton fabrics. These materials included batiste, challie, flannel, shepherd's plaid of different grades, striped wool material, tweeds, and danish cloth. Similar tests were made with silk fabrics. In this case the materials used were moire, taffeta, poplin, pussy willow, messaline, crepe, and crepe de chine. The results were as follows:

Result of shortening time

MATERIAL	CONCENTRATION KOH SOLUTION	TIME	RESULT
	per cent	*min.*	
Wool	5	2	Destroyed
Silk	5	4	Destroyed

[1] L. A. Taggart and J. G. MacKinnon, Iowa State College.

Since silk is always characterized by a greater resistance to alkalis than wool, it could hardly be expected to be acted upon in as short a time. However, it did disappear in four minutes, while wool required only two minutes of boiling.

The second phase of the question was whether a more dilute solution of the alkali could be used for the time stated in the directions. In this case the same materials and the same number of tests were made as with the 5 per cent KOH solution, the only change being in the concentration of the KOH solution. Experiments were made with 1 per cent, 2 per cent, and 3 per cent KOH and gave the following results:

Result of weakening solution

MATERIAL	CONCENTRATION KOH SOLUTION	TIME	RESULT
	per cent	*min.*	
Wool	1	20	Destroyed
Silk	1	20	Not destroyed
Wool	2	10	Destroyed
Silk	2	15–20	Destroyed
Wool	3	4	Destroyed
Silk	3	10–15	Destroyed

Again we notice the resistance of silk to the boiling alkali solution. The time required for the 1 per cent solution to destroy silk was not determined as it seemed impractical for most class work to increase the time element. The variation of time in the results for the 2 per cent solution was due to the proportion of Tussar silk present.

The last part of the problem was to discover the effect of this decrease of time of boiling of the 5 per cent KOH solution on the loss in weight of the cotton residue. The results of this part of the experiment were variable.

Series	Average *per cent*	Series	Average *per cent*
1	1.23	5	1.51
2	1.47	6	1.00
3	1.14	7	0.98
4	1.30	8	0.96

Each series consisted of 10 experiments with the same cotton material. This loss in weight is undoubtedly affected by the absorption of KOH by the cotton and is a factor which will have to be considered before any accurate determination can be made.

It is very evident from these results that in handling the ever increasing numbers of students in textile chemistry, a decrease may be made in the time element in the laboratory directions, and, instead of boiling the wool samples for fifteen to twenty minutes in a 5 per cent solution of KOH, they may be boiled for two minutes. In the case of silk, the directions may be changed to four minutes of boiling in the 5 per cent KOH solution instead of the twenty minutes. If economy of material is to be considered, the samples may be boiled for twenty minutes in a 1 per cent KOH solution if wool is being tested, and a 2 per cent KOH solution in the case of silk. If quantitative determinations are being made and the time of boiling in the 5 per cent KOH solution is reduced to two minutes, the correction for the loss in weight in the cotton residue is probably 1 to 1.5 per cent rather than 3 to 5 per cent.

A HOUSEKEEPING CENTER

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One who reads the series of books on Practical Homemaking by Miss Mabel Hyde Kittredge, or who visits the housekeeping centers established through her influence in the New York schools, is impressed by the value of such a method of teaching and usually filled with a desire to follow this movement for better training in homemaking for grade children, by the establishment of such an equipment in her own locality.

The difficulties confronting a teacher wishing to carry out such a project are many, especially since it is often necessary to interest a community before the necessary funds are forthcoming. The following account is given to show that a project may be started with the expenditure of a small amount of money, coupled with a large amount of initiative.

The young women majoring in home economics in Rockford College, have established a small homemaking school to be used in connection with their practice teaching in the public schools. A three room house

in the factory district is rented at a small sum, and furnished simply, but as far as possible in conformity with the dictates of good taste. The rent is supplied by an interested friend, and the total sum expended for furniture was about $35. This was made possible by loaned furniture, use of the facilities offered by the second hand stores, and a few gifts.

The kitchen contains a coal range which heats the house, two work tables, a stool, and garbage can, with a small simply furnished pantry and cleaning closet. The dining room has a table and chairs with some rocking chairs, as this room must be the living room as well. The bedroom is very simple, but as pretty as it could be made with cretonne and dimity. Since the house has no modern plumbing, there are all the problems in sanitation to be found in the humblest home. The house linen, bedding, and hangings are plain and inexpensive, but neatly made and immaculate. The pictures make an appeal to a child's imagination, and convey an idea of the beauty of home life.

Each class consists of girls from ten to twelve years of age. A series of lessons in cooking is planned with a meal in view, and in each lesson something is done with that as a goal. This means that all the details concerning a meal in the home are emphasized, from the marketing, preparation, and service of the meal, to the clearing away and the disposal of the garbage. The children may invite guests to the final meal, making it an event in their school life. Another time they prepare for a party, and another for a picnic lunch.

Lessons are planned also on cleaning, care of the bedroom, care of the baby, and any other phases of home making which seem especially needed by the children.

On account of the size of the public school classes, it has not been found that the homemaking school can take the place of laboratory classes, but it provides an excellent means of making the lessons more real and of providing a motive for them. As has been said, one purpose of teaching home economics in the grades is to develop a popular conviction as to the need for training in homemaking when the time comes for a girl to make a home, after her four or five years in industry. As a means of developing that conviction, we have found the housekeeping center excellent.

THE LUNCHEON AS A PROJECT IN ELEMENTARY AND SECONDARY EDUCATION[1]

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I sometimes think that Colonel Parker, one of the greatest educators of our times, had a vision of the possibilities of a real school way beyond what he gave to his students. That last year of his life a small group of us sat in the class room and listened as he tried to impress upon us that the education of the whole child took place only when that child had a motive for the doing of the tasks asked of him. Colonel Parker's motive and the present "project" seem to me to be closely related if not one and the same thing.

Could a child have a better motive for the preparation of food in school than the noonday luncheon? The answer to this question may be a varied one. The subject must be studied from many standpoints. The conditions in a rural place and in a large city are entirely different and the ordinary size town has the most difficult problems of all.

May I speak from the standpoint of the large city and tell you some of the things we have been doing and are planning to do in Chicago?

We have two lines of work where the luncheon has been used as a project in teaching food. One of these is in the Lucy Flower Technical High School. Miss Wells, Principal of the High School, gives this account of it.

The lunchroom itself shows one of the most obvious and necessary applications of school activity to daily needs. Its service is organized as regular classwork under the charge of a teacher in the department of household science. Classes that have already had some training in the laboratory kitchen and the laundry prepare the noon meal for the teachers and pupils who wish to buy. For obvious reasons the lunchroom is not open to uninvited outsiders. A student manager for the day plans the menu, does the necessary marketing, assigns to the other members of the class the various tasks in the processes of preparation, and is responsible for placing the lunch on the serving tables at the end of the hour and a half of time allotted to the work. In the more advanced of the two "lunchroom classes" the managers are required to keep the expense accounts and to balance them once a week with the office.

When the lunch period is over, girls from the lowest class of the prevocational

[1] Presented at the meeting of the American Home Economics Association, Kansas City, March, 1917.

department of the school wash the dishes and put the lunchroom and kitchen to rights. For this service they are paid at the rate of five cents for forty-five minutes' work. No girl is expected to work longer than this period in any one day. Visitors who smile at the scale of wages become respectful when they consider that five cents five times a week pays half a girl's carfare, and that without this help some girls could not remain in school. The lunchroom, opened November 10, 1911, has already paid to students for service rendered over $400 besides supplying free lunches to all who help in the preparation of the food.

The financial aid is, however, the least benefit derived from their lunchroom service. They are trained to work quickly and thoroughly. They make the glass and silver shine. They wash the dish cloths and dish wipers so carefully that they will bear inspection at any time. The work must be finished in fifty minutes. Sometimes the helpers work so fast that the teacher who is with them has time to read aloud for a few minutes from an entertaining book that has nothing to do with lessons. Not infrequently the girls are left to do their work entirely alone, and nothing gives the principal of the school greater satisfaction than to send a visitor into the kitchen to see what is going on while she remains out of sight and hearing. Do girls ever object to the lunchroom work? Occasionally, but when such a case arises, the student is excused from the work until her objection disappears in the face of public opinion. Usually we have a waiting list of pupils who are anxious to help. Self-respect, power, responsibility, dignity, and a distinct quickening in other phases of work—these are the fruits of service in the lunchroom.

We all contribute to the lunchroom at one time or another, and we are all served by the lunchroom by one way or another. Its service to us, and our service through it to each other, is concrete, necessary, and pleasant. It gives point and meaning to the rest of the work in household science. The lunchroom is in truth the center of our family life.

The conditions here have been almost ideal—the school has been small enough so that the problems involved could actually be handled by the students under the direction of a very skillful teacher.

Another entirely different phase of the work is the preparation of teachers' luncheon trays once a week by the elementary cooking classes. This was started to meet two needs—first, to give the teachers a hot luncheon once a week, and second, to help finance the department. Sometimes the finances are low and the cooking classes are cut to ½ cent per pupil per lesson. Have you ever tried to give lessons at ½ cent each? It is a good problem in mathematics for the teacher but that is its only value.

I believe thoroughly in this plan of luncheon trays; it allows the children to work in larger amounts, and helps to standardize their finished products. They learn more about the preparing of meals and the cost of food materials than in any other way possible in large city schools. There is a pathetic side to this, as there is to most things in life, for a hungry child may prepare one of these trays for some one else to eat.

The penny luncheons and recess luncheons were started simply to meet the needs of hungry, underfed children.

One of our critic schools is in an Italian district, and one morning I visited four or five first grade rooms with the principal. She asked the children what they had had for breakfast, and, with only three or four exceptions, over two hundred six year old children answered "Coffee and cake." Cake means white rolls with sugar frosting. When one realizes that liquor had been put in most of that coffee is it any wonder that the children get sleepy in school and seem stupid?

The problem that faced us was "What are we going to do for these children?" A recess luncheon and a noon penny and two penny luncheon were started in that school. This only touches the problem, but it helps somewhat.

Can those luncheons be made a project in education? No, they can not. The making of soup or cocoa for from four to six hundred children has no educational value for the ten year old child. It is a purely mechanical process that can be done by the least expensive kind of labor under the supervision of the teacher of home economics. Nor is the daily washing of dishes for 600 of any educational value.

A great danger, and one to which we must open our eyes is the use of children in the schools for processes which have no real value as training or education.

In another one of our critic schools we have tried the feeding of certain groups of children. These are children who show by certain tests that they are below normal. The blood test is taken by the school doctor outside of school time, and the rest of the tests are given by the psychology department. The Parent-Teacher Association pays for the food. The advanced students of the Household Arts Department at the Normal College prepare and serve the food, under the direction of the critic teacher. A careful record is kept of each child and of the kind and amount of food given. The tests are repeated at certain intervals. Decided improvement is shown very quickly both in the response to the tests and in the child's work in school. We wonder

in these times of efficiency when educators are going to wake up to the fact that it is a great waste to try to teach hungry, underfed children.

A large problem that faces us in Chicago is the high school lunch rooms. These are being taken over by the Board of Education and put under the direction of a household science teacher. Just how far these lunch rooms can be used as a project in education is still a question. I fail to see in the regular high school how very much use can be made of them from that standpoint. A close relation between class work and lunch room is possible. The lunch room can use the products of the class work, thus allowing the children to work in larger quantities and with the incentive for good finished products.

The whole subject of the noon day luncheon is a much larger one than is represented by this discussion. It is one that must be taken up by the training schools for teachers. Our city teachers today must be able to run lunch rooms and they must be trained for it.

NEW TABLES OF WEIGHTS AND MEASURES

(For future arithmetics)

4 ears of corn = 1 pint of milk
4 pints of milk = 1 egg
12 eggs = 1 pound of butter
128 pounds of butter = 1 barrel of flour
2 barrels of flour = 1 potato
2 potatoes = 1 16-carat diamond

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2 pans of ashes = 1 match
10 matches = 1 stick of kindling
12 sticks of kindling = 1 shovel of coal slack
160 shovels of coal slack = 1 lump of soft coal
10 lumps of soft coal = 1 lump of hard coal
2 lumps of hard coal = 1 16-oz. gold nugget

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10 rusty pen points = 1 blotter
6 blotters = 1 3c. postage stamp
6 3c. postage stamps = 1 bottle of ink
10 bottles of ink = 1 bushel of waste paper
25 bushels of waste paper = 1 pound of news print
10 pounds of news print = 1 Ford automobile

WHAT THE HOME ECONOMICS TEACHER CAN DO[1]

One of the criticisms which the home economics teacher meets most frequently is that she is impractical and extravagant in the use of food products. Such criticism may have been deserved at one period in the teaching of foods and cookery, but for some years there has been a growing emphasis on questions of practical economy. Nevertheless, the present crisis in the food situation comes as a direct challenge to all teachers of foods and cookery in the United States. Their scientific knowledge, their technical training, and their close relation to the homes of the community in which they teach, give them a unique opportunity to serve their country at the present time. The value of the home economics courses in our schools will be put to the test as never before, and all who have had the privilege of pursuing such courses, from the child in the grades to the college graduate, will be expected to contribute to the solution of the national problem. . . .

For the large majority of teachers of home economics increased emphasis on the subjects which form a legitimate part of the daily instruction in the classroom, and the assistance that they can render to those outside the schools along similar lines will be the best service they can render.

Proper food selection and service, to help in the elimination of waste and the control of extravagance, are the basic factors that should receive emphasis in every school kitchen. The factors having to do with the regulation of cost must be studied in so far as possible. The local market should be used as a class laboratory to a greater degree than has yet been done in our home economics teaching, and wise buying should be emphasized as both an individual necessity and a national responsibility.

A minimum food standard for effective work must be discussed. A study must be made of the methods of cooking for the combined purposes of elimination of waste, improving the digestibility of foods, and simplifying combinations, in such a manner that both time and materials are economized. The substitution of those foods which will be plentiful for those of which there is apt to be a scarcity during the coming seasons must be urged. The products of the home garden should be utilized to the fullest extent, all the surplus—that for which there is no

[1] From Home Economics Letter No. 19, issued by the Bureau of Education, Washington, D. C.

need during the summer months—being dried or canned for winter months.

Simplicity in the planning of meals and in the service of foods is of as great importance as care in cooking. Those features of service which only multiply the factors of expense without increasing personal comfort and social satisfaction should receive condemnation in our home economics courses and the extravagances to which they lead should be pointed out as dangerous to the development of the proper spirit of economy.

It is not sufficient that the home economics instructor emphasize the fact that from the time the food enters the market until it is consumed at our tables there is danger of wastefulness in every step of its handling, that each process in its preparation by the housekeeper for use at table involves problems worthy of careful study, and that individual and community habits of eating must be intelligently controlled; she must also be prepared to offer a constructive program for the immediate improvement of conditions within her own community, enlisting the active coöperation of all of her students and the hearty endorsement of their parents.

FOR THE HOMEMAKER

WE'RE ALL IN THE SAME BOAT

Our first military need in this crisis is an adequate food supply. European nations have learned by bitter experience that the cutting down of the cost of food to the consumer below a paying price to the farmer, means nothing less than sawing off the limb on which both consumer and producer are sitting.

The consumer must be made to understand that unless he pays fair prices, the farmer can not and will not sow. And the farmer must be made to realize that unless he sows, the city consumer can not live to do his part for the national defense. We are all in the same boat, those who buy food and those who grow or raise it. If anyone scuttles it we shall all sink.

The nation needs food, needs it for our civilian population, for the neutral countries, for our soldiers, and for the soldiers of our Allies who daily are dying by the thousands fighting our battles. The experience of other nations indicates that to get food it may become necessary to guarantee to the producer a price high enough to repay him for his labor and expense, plus a reasonable profit. The next thing is to market it at the smallest possible advance over its cost on the farm. The third step is to conserve our food products, to eliminate over-eating, unintelligent eating, and all other forms of waste.

When there is too little food the nation must go hungry. When there is enough food but no efficient system of marketing it, again the nation goes hungry, while crops rot on the ground. Even when there is enough food and it is efficiently distributed, the nation may go hungry tomorrow if its people gorge and waste today.

From the standpoint of both the consumer and the farmer, the Government should not be without power to guarantee the producer that for his wheat and for his corn, for at least his non-perishable crops, he should be certain of paying prices. If the emergency demands it, this power should be exercised, in order to protect the consumer by insuring the production of food and the farmer by insuring a return for his investment and his labor.

But the Government must also eliminate those middlemen standing between the farmer and the consumer who corner food products and practice extortion. The Government is already doing everything possible to bring the producer and the consumer together for their mutual benefit. The Government does not propose, so far as the power within it lies, to permit one dollar to go to any man who fails to perform a definite social service.

No suggestion has ever been made to impose prices lower than the prices received by farmers for foodstuffs during the past year. Rather the reverse. If the Government had the power to fix a maximum price, it would use this power as a club, to be applied only in individual cases where it was clear that an individual or a corporation had cornered foodstuffs or was practicing extortion. After each particular abuse had been controlled by the exercise of this power, the incident would be closed. Any further exercise of such power would depend upon the appearance of another similar concrete condition. Such maximum price-fixing power would not hurt the farmer nor any one else except the disloyal manipulator of foodstuffs.

If the Executive has adequate power, it is believed that it will be able to keep the prices of food staples from being artificially raised by speculators and gamblers, without having resource to the additional power to establish maximum rates. In asking Congress to confer such power, the purpose was to use it only as a last resort.

In order to win this war the Government and the people—the producer, distributor, and consumer alike—must pull together. Any citizen or group of citizens who pulls in the wrong direction is pulling away from victory. The consumer should help to see to it that the farmer gets reasonable prices for his products. The farmer likewise should throw his influence into the scale and help the Government to protect the consumer from the extortion of unscrupulous and disloyal food speculators and food cornerers.

CARL VROOMAN,
Assistant Secretary of Agriculture.

THE HOUSEWIFE AND THE FISH PROBLEM

HENRY B. WARD

Special Investigator, United States Bureau of Fisheries, and Head of the Department of Zoölogy, University of Illinois

Universal emphasis is being laid today upon the injunction, *eliminate waste*, but in discussing the fish problem I would substitute for this the injunction, *eliminate prejudice*. Not that there is no waste, but that is a feature which concerns chiefly the fisherman and the fish-distributing agencies, whereas the aspects of the problem that appeal to the homemaker include only in a minor degree the question of food wasted.

There is indeed a fish problem and it concerns all but a small portion of our country. In those localities that are immediately adjacent to the ocean or to a few of the famous fish-producing streams of the eastern and western coasts, one finds a fairly regular consumption of fish food, though even here it is not so generous as it deserves to be when the quality of the food and its reasonable cost are properly weighed. But throughout the length and breadth of the land away from the narrow seashore zone it is only in isolated localities that much if any attention has been paid to this type of food. Most families plan for fish once a week or less frequently; if they do not find just what they want available, they are apt to pass it by, and meat is substituted. Thus for one cause or another the average fish consumption in the interior portion of the country falls far below that which obtains in the Old World, or that which should exist here when our extensive and splendid supply of fish food is taken into account.

This condition is partly one of indifference or carelessness, fostered by the fact that the limited demand for fish food has resulted in leaving the market undeveloped so that it is sometimes difficult to secure fish; but it is also in good part due to certain very definite prejudices that throughout the central section, at least, meet one frequently and are repeated with positiveness in every discussion on the topic. It is not my intention to speak of the distinctly absurd prejudices like that which attributes the transmission and spread of cancer to fish food; such a prejudice is purely imaginary, is not supported by a scintilla of scientific evidence, and is refuted in the clearest fashion by the statistical facts concerning the occurrence and frequency of cancer in various regions.

Nor would I lay too great an emphasis upon the rather easy criticism which is frequently heard that fish food is not to be obtained in good condition. This is an excuse rather than a prejudice, in most cases. It is true, of course, that food products in general are often not well cared for, like fruit and vegetables exposed on outside stands to the influence of wind and weather, or like meat laid out on counters subject to frequent visit and contamination by flies, conditions which are neither hygienic nor attractive. Under similar conditions, the best fish that the wholesaler can furnish will reach the consumer in a condition that is not calculated to command approval. But all in all, fish food is probably as well handled as any other type, and when reasonably cared for is thoroughly hygienic and also attractive to the consumer.

The first of the prejudices I have in mind is that fish should be purchased only on Friday. The work of the fisherman covers more than a single day in the week, and to be efficient from the economic standpoint and satisfactory for the public, the fish business should be encouraged by the distribution of the demand over a larger part of the time. If a meatless day is to be adopted, let it be Tuesday; but there is much to commend the slogan, "Every day a fish day."

Another prejudice is the view of the individual housekeeper that she must always have a given kind and size of fish. Sometimes it is possible to meet her wishes in this respect but there are other parts of the year in which it is impossible, for instance, to get small trout, and some other type should be substituted until the individual variety comes into the market again in the course of events. Certain fish are "in season" just as well as certain meats.

One of the most serious prejudices that limit the satisfactory development of fish-producing and distributing industries is based on the scanty knowledge of fish possessed by the average housewife. She has learned to know one or two sorts, and, failing to find those or ascertaining that at the particular moment the price of her favorite type of fish has gone up beyond what she expected, she refuses to consider anything else for the day at least and gives up fish food entirely. She has lost a splendid opportunity, for among our fish there are many sorts not known to her by name that furnish food that is as good as some of the types with which she is familiar, or that might even be considered better.

The Bureau of Fisheries has recently published a series of Economic Circulars for the purpose of educating the public on the value of various fish and the best methods for preparing each kind. One of these em-

phasizes the value of the burbot. This is a fresh-water fish and belongs to the cod family. It is indeed the only representative of that group which occurs outside of the sea. The flesh is firm, white, very palatable, and in continental Europe has long been regarded as a delicacy. Yet in this country the demand for the fish up to the present time is very low. It should be far more widely known and used, as it deserves in every way the praise bestowed upon it. As it is placed on the market skinned, dressed, and headless, there is practically no waste and the initial cost is low so that it merits especial consideration in these days of rising prices.

Another fish of unrecognized worth in the Mississippi basin is the bowfin, which rejoices in a score of other names in various localities. It is scientifically of great interest because of its isolated position, not being related to any other fish in the modern world. In the fresh condition its flesh has been condemned as soft and pasty; but smoked and salted according to the simple method devised at the Fairport (Iowa) Biological Station it acquires a rich flavor which leads even the most prejudiced to acclaim its merits. Incidentally one may note here that the preservation of fish by curing, salting, and smoking, which is almost a lost art in our country, should be generally encouraged, as it adds distinctly to the amount and variety of foods available at moderate prices.

The much abused carp is, after all, a fine fish when properly prepared for the table. In spite of the high esteem in which it is held abroad, that which is caught in Illinois is shipped mainly to New York because of the prejudice against it in local markets. In a bulletin giving the results of experiments on the fish in the Household Science Department of the University of Illinois, Goldthwaite says, "Properly cooked, carp is a well-flavored fish of good texture, and one which need not be shunned because of the dangerous forked bones."

There is every reason to encourage the more general use of the common fish of pond and river as they are easily obtained, the supply can in most places be readily increased through local activities, and both food value and quality are high. The common catfish has, for instance, a total food value of 1100 calories per pound, being thus actually slightly superior to meats except pork, though the calories due to protein are less than in meats and other fish.

Even among ocean fish there have been recent valuable additions to the list of available types. Perhaps the most famous example is the tile fish, which, once apparently exterminated by a supposed shift in the

Gulf Stream, has become reëstablished on its old grounds within very recent years. It is a large deep-water fish that possesses excellent food qualities and will soon be in markets from the Atlantic coast as far west as the Mississippi at least.

Another new applicant for public favor comes from the deep waters of the Pacific. It is the sablefish, wrongly called the black cod by early settlers and fishermen. In truth its rich, oil-filled flesh contrasts strongly with the dry meat of the cod and demands very different preparation. Of the sablefish the Department of Home Economics at the University of Washington says, "It is suitable for the humblest home on account of its price, and for the millionaire's table from its fineness of texture and delicious flavor." It ships well and may be had fresh or frozen as far east as New York and New England. In this case as in others it is important to buy the fish still frozen and thaw it in cold water just before it is used. Housewives who adopt this method will find frozen fish really equal to the fresh product.

Among canned fish there has appeared a new product in the form of the grayfish which is now, after two years of experimental work, being widely distributed. It is meeting with great favor and promises to afford an abundant supply of fish food. Though used on the shores of the Mediterranean since ancient times, it has only recently come into notice here. It is marketed fresh in the coastal region and is to become available in smoked form this year. It is most excellent as well as very reasonable in price. This is the first of the unused types of fish which the Bureau of Fisheries tested and has been persuading the public to try. The success of the effort is shown in the fact that the pack of last year was exhausted before the new pack came on the market. The supply of these fish is very large and the increasing demands of the market can easily be met.

The utilization of these new fish should be advocated far and wide; it is not an experiment, as all of them have been used for years elsewhere and are rapidly growing in public favor here also. While prevailing high prices have opened the way for the favorable reception of such fish as can be had on more favorable terms, even if they bear strange names, their merit assures their position in public favor long after the present crisis has past.

THE TIN CAN

CARRIE ALBERTA LYFORD

Specialist in Home Economics, United States Bureau of Education

"Before men can fight they must be fed. How few people realize that the feeding of a great people, either in peace or war, is largely a metallurgical problem with which the steel industry is primarily concerned! Not only much of our harvest yields but also the major portion of our annual sea food must be packed and preserved in tinned cans. A "tin can" is really made of sheet steel covered over with a thin wash of tin, and no other metal known can be used as a substitute. In spite of the fact that a tinned can carries only a small weight of tin, so great is our canning industry that in 1914 we imported from overseas 52,919 tons of this metal, valued at about $33,000,000. Tin is not found in paying quantities in the United States, and in 1914 only 157 tons were produced in Alaska. The principal world source is in the East Indies and the Malay States, and is controlled by Great Britain. Tin ore is also found in Bolivia and is at present being imported, and smelted in New Jersey, but thus far tin from this source is only a small factor in a great industry. As has been shown, the question of our tin supply is a most important factor in our food supply."

The foregoing statement is quoted from a paper presented before The Franklin Institute by Dr. Allerton S. Cushman, Director of The Institute of Industrial Research, Washington, D. C. Dr. Cushman has said further that the additional canning necessary during the war makes a greatly increased drain upon the supply of tin. For our do-domestic production 3.6 billion cans were required for food products in 1914. It is estimated that from six to seven billion cans will be required for the year 1917. It will be necessary to can food for an army of 1,000,000 men. The questions arise, Can a sufficient amount of tin be procured? Can unnecessary uses of tin be stopped? As unnecessary uses, the Institute of Industrial Research cites the use of tin for kerosene cans (chiefly exported), for tobacco, baking powder, and other dry powders. Once used, tin cans are of comparatively little value, though they may be heated in very large numbers to recover the solder and tin. The iron also will bring something for rough purposes.

At the recent conference in Washington of Government officials and tin can and tinplate manufacturers and representatives of the tinning

trade, instructions were given to prepare plants to exercise full and intensified capacity in order to meet the increased demand for tin cans to contain the food for the armies and the starving nations of Europe.

In view of the shortage of the tin supply and the great demand for shipments of canned goods to the allies and to the training camps at home and abroad, the housekeeper may help by observing the following rules:

First. Use vegetables and fruits freely while they are in season and abundant.

Second. Use glass jars to can all necessary surplus from the garden, or preserve by drying.

Third. Learn to use dried vegetables and fruit and to use them in a variety of ways.

Fourth. Increase the number of dishes in which winter vegetables are used and let them form a large part of the diet during the winter months. Winter vegetables that keep for months without canning may be prepared in appetizing form to give the needed variety.

Fifth. Do not demand those commercial goods in tin containers that can be perfectly well kept in containers of other materials.

Sixth. Do not demand soups or other liquid foods in cans if the material that enters into their composition can be obtained in more condensed form.

Seventh. Study the comparative cost and nutritive value of fresh meat and canned meat and use canned meat only when absolutely necessary.

Eighth. Make every effort to use new or little used fresh foods that are easily available and inexpensive. As far as possible substitute such foods for those canned foods that have been used in large quantities.

Fill every can full of food. The can supply warrants it; the law requires it; the National emergency demands it.—*National Canners Association.*

MARMALADE AND JAM

Less Sugar and Some Salt

ISABEL ELY LORD

In April Dr. C. F. Langworthy called attention to an article in *Foods and Cookery* (an English magazine) on the saving in sugar effected in England by using salt for part of the sugar in the jam sent to the front. This was made a subject for experiment at the School of Household Arts, Pratt Institute, and the results tested by many people, and pronounced good.

Method. Six ounces of sugar and $\frac{1}{4}$ ounce of salt were used with 1 pound of fruit. The salt and sugar were added together, and the jam was made as usual.

This should not be eaten until five or six days after making, since it will take that time for the characteristic salt flavor to disappear.

The fruits used were strawberry, pineapple (with rhubarb and with apricot), orange and lemon. All were good, and there seems no reason to suppose that the method would not be equally successful with other fruits.

Cost. With sugar at nine cents a pound, this saves two cents a glass over the usual proportion of a pound of sugar to each pound of fruit. Where fruit costs little or nothing, this makes the jam very cheap.

Flavor. The jam is perhaps less rich, but it is very palatable.

Food value. The jam, of course, loses decidedly in food value when the sugar is lessened, but as it is eaten usually to give flavor rather than to furnish energy, there seems no disadvantage in this as long as those who eat it know of the substitution.

Brown sugar. The English account suggests using brown sugar, but this was not found advisable in the experiments. It gives a darker color to the jam, which is not attractive, and, with strawberry, pineapple, rhubarb, and apricot, it detracts from the flavor of the fruit. In orange marmalade it gave an over-sweet flavor.

CORN MEAL BREAD

MRS. F. L. STEVENS

University of Illinois

YEAST MIXTURE WITH MAGIC YEAST OR YEAST FOAM

2 cups water
1 cake dry yeast
2 tablespoonfuls sugar
2 tablespoonfuls flour
½ cup boiled mashed potatoes
¼ teaspoonful salt

Soak yeast in 1 cup of water. Mix dry ingredients, add potatoes and the other cup of water. Add soaked yeast, beating mixture thoroughly. Let rise over night. The yeast will be ready in the morning.

BREAD

1 cup lukewarm (scalded) milk
2 tablespoonfuls sugar
3 tablespoonfuls butter or lard
1 teaspoonful salt
1 cake dry yeast prepared according to above directions
Flour
1 cup corn meal cooked in
2 cups water

Mix ingredients, adding yeast mixture and flour to make a thin batter. Beat thoroughly with a spoon or egg beater, finally adding the scalded corn meal, which has been thoroughly cooled. Add flour and knead to make a firm, elastic dough. Let rise until the mass has doubled its bulk. Shape into loaves. Let rise again until the loaves have doubled their bulk. Bake.

OUR PRIVILEGE AND OUR PATRIOTIC DUTY IS TO CONSERVE

WHAT?

Food, Clothing, Health, Beauty, Higher Life.

WHEN?

Every day.

WHERE?

Everywhere.

WHY?

That life may be better worth the living.

—Adapted from Chicago Headquarters, Women's Committee, Council of National Defense.

STUDENTS' CONTRIBUTIONS

MANUFACTURED SILK

IRENE BJORKLUND

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It is only of late years that manufactured silk has come to be of more than theoretical importance. That it is now practical is shown by the fact that in 1912 the world's product was 8,000 tons, at a value of $30,000,000.[1]

Possessing a luster exceeding that of true silk, together with the ability to take dyes easily and beautifully and the all important qualification of cheapness, manufactured silk has only to prove its durability and adaptability. Durability, however, does not always mean today what it meant to the woman whose best, and often only, black silk dress was expected to last ten years or more. If hat braid of manufactured silk, for example, can do duty for two or three seasons, few indeed are the women who would ask more of it; very few as a matter of fact who would expect or desire as much. For whether we like it or not, the rapidly changing fashions have a very marked effect upon our standards of value. The insistent demand for cheap silk hosiery, for example, has forced the manufacturers constantly to reduce the weight of silk used until black stockings may be more than semi-transparent, and occasionally has caused fraudulent over-weighting with mineral salts, greatly reducing the wearing qualities of the silk.

As the possible thinness of silk stockings approached its limit, substitutes for silk were naturally sought and found. Two of these, highly mercerized cotton (most of the vegetable silk advertised), and artificial silk, are certainly a better purchase, at 50 cents a pair, than true silk at the same price. Manufactured silk hosiery bids fair to become a staple, but, with the exception of skirt and hat braid, it seems probable that the chief use of the fiber will be for knit goods novelties. Silk sweaters, for example, are so expensive if made of true silk that they are out of the question for the majority of people. Manufactured silk makes

[1] Fiber and Fabric—Dyeing of Artificial Silk, November 19, 1914.

them relatively cheap. Neckties, mufflers, and caps are some of the other novelties commonly made partly or wholly of this fiber.

The brilliant luster of manufactured silk is used to advantage when the silk is combinnd with other fibers. For upholstery, where a close even weave is not required, it is sometimes used alone, and very frequently in combination with jute, hemp, and other fibers. Viscose plush is made with a cotton back. Since it is so decorative, artificial silk is widely used for stripes or small figures in cotton and wool materials. Interesting effects are produced by cross dyeing, for viscose threads of various colors may be woven into the undyed wool or silk, which can be subsequently dyed without affecting the cellulose silk, that, like cotton, requires a mordant.

Another use for which manufactured silk promises to be valuable is for embroidery. The fiber is not pliable enough to be used for very fine work but where the design requires bold strokes with heavy silk, beautiful effects may be produced.

In order thoroughly to understand the possibilities and limitations of artificial silk as well as the marks that distinguish it, some knowledge of its source and methods of manufacture is necessary.

True silk is produced from two large glands extending along the greater part of the body of the silk worm, and terminating in two spinnerets at the head. As the liquid, which consists mainly of the protein fibroin, flows from these two glands, the streams are cemented together by a gummy substance called sericin. The silk solution passes out through the tiny openings or spinnerets and is coagulated upon contact with the air, thus forming a filament, the average diameter of which is 0.018 mm. How the liquid silk differs from the hardened filament is not known, for coagulation of the liquid is too rapid to allow examination.

The constitution of proteins being still unknown, fibroin cannot be synthesized, so the name artificial silk, in the sense that we speak of artificial indigo, is a nisnomer. The best that can at present be done is to manufacture a silk-like filament. For this reason there have been many attempts to coin a name more characteristic of the new type of textile fiber, but, so far, none has been very successful.

The first problem confronting the manufacturer is the selection of raw material. This must be such that a fiber can be formed from it that will have the luster of true silk, will be fairly strong and durable, and will, above all, be cheap. Since fibroin is a protein and the physical and chemical properties of proteins are so similar, one would naturally

suppose these to be the best source of raw material, but this is not the case. Gelatine silks have been made but have never been a commercial possibility mainly because they have no textile strength when wet and only one-sixth that of true silk when dry. Casein silk has been the subject of much investigation, but, while interesting theoretically, even if a good silk were finally made, the cost of any animal fiber would probably be prohibitive since it must compete with the lustra-celluloses made from wood pulp.

Cellulose, in fact, is the basis of all of the commercially successful silks. Four important cellulose derivatives have been used: (1) the nitro-cellulose, (2) the acetate, (3) the cuprammonium, and (4) the viscose. Purified cotton waste is used for the first three, and wood pulp for viscose. Both cotton and wood have a characteristic cellular structure, while the silk fiber, on the other hand, is a structureless tube. It is therefore first of all necessary to destroy the structure of the raw material if the physical properties of silk are to be imitated. This is done by preparing a soluble cellulose derivative. In the case of the nitro-cellulose, the purified cotton is treated with nitric acid and a dehydrating agent (sulphuric acid), the composition of the nitrates formed being dependent upon the temperature, the time of contact, the concentrations of the acids and the relative amounts employed. A mixture of alcohol is used as the solvent. For the acetate silks chloroform or ethyl acetate and alcohol are the commonest solvents, the cellulose acetate being manufactured by various methods. The cuprammonium silks are obtained from a solution of cellulose in ammoniacal copper oxide, while the viscose silk depends on the formation of a cellulose sulpho-carbonate.

Great indeed are the mechanical difficulties surmounted by the manufacturer. The spinnerets of the silk worm are imitated by minute capillary tubes of glass or platinum. The orifices of these must be fairly uniform in size if a uniform product is to be obtained, yet they are sometimes not more than 0.08 mm. in diameter. They may be formed by heating glass tubes to redness and drawing out rapidly. These are standardized by measurements under the microscope and only those whose diameters fall within certain limits are used. The platinum tubes are said to be cut with very fine dies.

The solution must be perfectly homogeneous in order to pass through such minute tubes, and so repeated filtration is necessary. Coagulation of the filaments is the next process. In the case of the nitro-celluloses this is usually accomplished by rapid evaporation of a volatile solvent

such as ether and alcohol, but in other silks a coagulant is generally used. The coagulating bath consists of a solution in which the cellulose derivative is insoluble. Petroleum hydrocarbons are most often used for the acetate silks, ammonium sulphide for the viscose.

The silk solution enters the coagulating bath directly from the spinnerets, so that the surface is immediately hardened. The interior being still liquid, the filament may be drawn out until it is several times smaller than the orifice through which it has passed, a process greatly increasing its lustre. A number of filaments are then united together to form a single thread which is wound on spools. The rate at which the silk solution passes through the spinnerets is important, and is determined largely by the viscosity of the solution, the size of the spinnerets, and the pressure employed. One of the nitro-cellulose methods requires a pressure of 40–50 atmospheres when the orifices are 0.08 mm. in diameter, while the Glanzstoff (cuprammonium) makes use of only 1.5–2 atmospheres, but the spinnerets are 0.12 to 0.15 mm. in diameter. In general it may be said that the main factors determining the formation of a filament are the rate of passage through the spinnerets, the nature of the coagulant, and the tension to which the filament is subjected in the coagulating process.

With the nitro-cellulose silks, denitration is necessary, after the silk has been wound on the spools, in order to render it non-explosive. A bath of ammonium sulphide is commonly employed for the purpose. The chief disadvantages of this type of silk are: (1) cost because of the large amounts of ether and alcohol employed, (2) weakening of the fiber by water, and (3) danger in the manufacturing process because of its explosiveness. Cellulose zinc chloride filaments are also made. They are not strong enough for weaving, but are used for incandescent light mantles.

The acetate silks are made from cellulose acetates, which remain as esters in the finished product. For this reason, these silks are not readily affected by water, as is usually the case. They are also characterized by their non-inflammability, their resistance to the dye-stuffs, and their ability to incorporate within the fiber large quantities of softeners (organic substances of many types), which give them great pliability. They are the most costly of the artificial silks, and so are little used, though the cellulose acetates are very valuable industrially for insulating copper wire for electrical apparatus and for certain expensive lacquers. The cuprammonium silks superseded the nitro-cellulose because cheaper

and more satisfactory, but they, in turn, have been replaced by the viscose. Viscose is the cheapest of the artificial silks, and is practically the only kind manufactured in the United States.

Commercial viscose is not made from cotton but from wood pulp ground with solid sodium hydroxide until a finely divided crumb-like mass is obtained. The excess of moisture is then pressed out and the soda cellulose is allowed to lie for some time before being treated with carbon disulphide. The resulting mass is dissolved in water and filtered to remove any cellulose fibers. The spinning frame consists of a double series of small pumps that force the solution through platinum spinnerets pierced with very fine openings, the number of which varies according to the size of the thread desired, the average number being about 18 orifices per thread. Ammonium sulphate is used for a coagulant. The filaments are united into a single thread immediately after hardening, and are then wound on a turbine bobbin which collects them into skeins and gives the thread the right degree of twist. The yellow color is removed by bleaching powder or sodium hypochlorite. Viscose dyes very easily and beautifully in a lukewarm dyebath for cotton.

In reply to the practical questions: (1) How may we know it? (2) What are its limitations? (3) What may we expect of it? It may be said that its very high luster, the coarseness of the thread, its lack of pliability, its very low tensile strength, are usually sufficient to distinguish manufactured silk. Some of the coarser poorer qualities of silk such as that used for belting might be mistaken for it, but the threads are not nearly so easily broken; moreover threads of true silk when broken show very fine fibers which "fuzz up" at the ends. The best household test is burning. True silk, unweighted, burns easily with the characteristic odor of protein (such as burnt hair, for example), forming a bead-like mass at the ends; weighted may scarcely burn at all, while artificial silks, excepting the acetates, burn very rapidly as cotton does. If these tests prove inconclusive, Millon's reagent (mercury in nitric acid) may be used for light colored materials since all proteins and hence silks are turned red by it and the cellulose derivatives are unchanged.

The different kinds of artificial silks may be distinguished by microscopic tests and by concentrated sulphuric acid, but this is not important since viscose is used almost universally, at least in this country. Germany seems to be one of the foremost in this industry but the writer was unable to obtain any information regarding the methods employed.

It may be added that in case a revision of the tariff on a protective basis again occurs, a tariff on artificial silk will probably be included therein, presumably to prevent competition with Germany.

Regarding the limitations of the fiber, it may be said that the main objections to the use of manufactured silks have always been their low tensile strength compared with true silk, and the fact that they are much weakened by water.

The remarkable difference in tensile strength between true and manufactured silk is due not to lack of strength in the fiber itself, but to the lack of qualities necessary for spinning. Wool has little microscales that aid the spinning process as they tend to interlock; cotton has a natural twist that favors this process; and silk, while a structureless tube, has other qualities which make it spin easily. Manufactured silk has none of these; its use is limited, therefore, to coarse weaves, knit goods, and embroidery silks, which do not require a tightly twisted thread.

The fact that manufactured silk regains its strength when dry makes the loss of strength when wet of very much less importance. Obviously manufactured silk would not be suited for surgical or other scientific purposes where great strength and softness are required. Artificial silk of good quality will not, as formerly, disintegrate if left upon the tongue, but is naturally much more easily broken than true silk. A wool material having a viscose design was boiled out in the laboratory in a 5 per cent solution of potassium hydroxide, disintegrating the wool but leaving the viscose unchanged, thus showing that this type of artificial silk is unaffected by dilute alkalies at a boiling temperature, and consequently is uninjured by laundering.

By way of summary the following points may be noted:

1. Viscose is not a general substitute for silk as it does not possess its softness, its strength, or its fineness.

2. Its luster renders it excellent for decorative purposes, especially in combination with other fibers.

3. Viscose is pre-eminently fitted for knit goods and braids where its resistance to spinning is not especially important.

4. Viscose withstands laundering (even with free alkali), is cheap, is stronger than silk goods highly weighted with stannous chloride or other salts, and may on the whole be used fearlessly wherever its physical properties make it attractive to the purchaser.

EDITORIAL

Home Economics Conferences in Washington. On April 30, at the call of the Assistant Secretary of Agriculture, the editors or representatives of household and women's magazines met in conference at Washington to determine how their publications could best use their columns for help in the present crisis.

Among other things it was agreed that each month one article be furnished the magazines to be published "without the change of a comma." The article by Mr. Vrooman in this issue is the first of these. Not only in its promise of material, but in its contribution to mutual understanding the conference was worth while.

On June 2, Mr. Hoover called together in Washington a group of representative workers in home economics. After addressing them for a few moments he asked Dr. R. L. Wilbur, president of Leland Stanford Jr. University, and now acting as head of the Food Conservation Division of the Food Administration, to conduct the conference. Both morning and afternoon were spent in discussing the relation of Home Economics to Food Conservation, and in planning efficient methods of work for different localities, and conditions. Partly as a consequence of this conference the Home Economics Advisory Committee was appointed. As this number goes to press another conference of editors of household and women's magazines has been called by the Red Cross officials at which Red Cross needs and aims are to be presented, the organization explained, and coöperation of the publications asked.

THE JOURNAL OF HOME ECONOMICS has been represented at all of these conferences, and its cordial coöperation promised.

THE PLEDGE OF THE GENERAL FEDERATION OF WOMEN'S CLUBS

"In view of the pressing military necessity of conserving the food supply of the Nation, I hereby pledge myself to do my bit as follows:

"I will use only those amounts of food required for adequate nourishment. I will endeavor to control the waste in all kinds of materials in the household and to live simply.

"I will begin now."

ANNOUNCEMENT

The Ellen Richards Research Prize. The Naples Table Association for Promoting Laboratory Research by Women announces the offer of a research prize of $1000 for the best thesis written by an American woman embodying new observations and new conclusions based on independent laboratory research in Biology (including Psychology), Chemistry, or Physics. Papers published before 1916 will not be considered and theses presented for a Ph.D. degree are not eligible. Theses offered in competition must be in the hands of the Chairman of the Committee on the Prize, Dr. Lilian Welsh, Goucher College, Baltimore, before February 25, 1918. Application blanks may be obtained from the secretary, Mrs. Ada Wing Mead, 823 Wayland Avenue, Providence, Rhode Island.

THE QUESTION BOX

Conducted by a committee of the Science Section of the American Home Economics Association. Chairman, Prof. Amy Louise Daniels, University of Wisconsin, Madison, Wis. Questions may be sent directly to Miss Daniels.

Question: Unfertilized eggs which have been incubated for varying lengths of time are usually thrown away or cooked and used for food for chicks. Is there any reason why these may not be used for human food?

Answer: Unfertilized, incubated eggs are often superior to many cold storage eggs. With one exception these may be used in any of the usual ways in which fresh eggs are served. During the incubation process the membrane which holds the white has become changed so that the white no longer holds together, therefore these eggs are not satisfactory for poaching. The flavor of the eggs incubated as long as seven days is not different from that of fresh eggs. Both sponge and angel cake, a sure test of good eggs, can be made from these.

Question: Is there any justification for the statement that salt added to vegetables during the process of cooking hardens the cellulose and so keeps the vegetables intact?

Answer: Chemically pure sodium chloride (table salt) has no effect on cellulose, nor in the process of cooking in dilute solutions has it any

appreciable hardening effect on the substance of which vegetables are composed. Most table salt, however, contains a considerable amount of calcium, and if a generous amount of this sodium chloride is added to certain vegetables, namely the legumes, in the process of cooking, the effect will be the same as if the vegetables were cooked in hard water. In fact, the Canner's Association have found it unwise to add salt to peas during the process of cooking, because the salt used contains enough calcium to harden the product.

Question: The reason usually given for the use of lactose, rather than some other form of sugar in infant feeding, is that lactose is less easily fermented, and therefore is better born by the average infant. What authority is there for this statement?

Answer: Lactose is less quickly absorbed from the alimentary tract than other disaccharides, and therefore offers greater opportunity for bacterial action and the formation of lactic acid. This lactic acid may prevent the development of putrefactive organisms which so frequently lead to digestive disturbances. When given in excess lactose is more likely to cause diarrhea than are other disaccharides. Many pediatrists believe that, although lactose is helpful under certain conditions, dextri-maltose preparations are better tolerated by the average infant.

References: Sauglingsernährung und Säuglings Stoffwechsel, II and III, p. 129, 1914.
Diseases of Nutrition and Infant Feeding. Morse and Talbot, p. 192, 1915.
The Influence of Lactose on the Metabolism of an Infant. Talbot and Hill. *Amer. Jour. Diseases of Children*, Vol. VIII, 1914, p. 218.

Question: Is there any authority for the statement sometimes made that milk is not so easily digested in the stomach of an adult as it is in the stomach of a child?

Answer: It is believed by a number of investigators that rennin and pepsin are the same enzyme, the difference in the chemical behavior of the enzyme being due to the difference in the medium in which it is acting. If this is so, you can see that the rennetic action of the adult cannot differ in any way from the rennetic action of the child, both depending upon the activity of pepsin.

An article by Bremmen, in the *Journal of American Medical Association*, Vol. LX, 1913, p. 575, shows that the action of the rennin (or pepsin) of the adult is not inefficient.

Question: What are the reasons why coffee is less injurious if used clear than if used with cream and sugar?

Answer: Only those individuals suffering from fat indigestion have difficulty in digesting coffee with cream and sugar. Here it is not so much the coffee but the fat of the cream that is causing the disturbance; and although it is true that tannin in both tea and coffee inhibit digestion in proportion to the amount present, the tannin might better act on the protein of the cream or milk rather than on the gastric secretion.

Question: Is there any authority for the Statement that crisp bacon is less digestible than that cooked until it is slightly brown but not crisp? Is there any benefit derived from pouring boiling water on bacon and then pan boiling it?

Answer: Under certain conditions, for example hypochlorhydria, bacon which is cooked until it is crisp and therefore contains less fat, would be more desirable than that cooked a shorter time, since fat delays the gastric secretion. On the other hand, crisp bacon contains less nutriment, since much of the fat is cooked out during the process of cooking. The general belief that super heated fat is unwholesome has not been born out by experiment.

The custom of pouring boiling water on bacon before pan boiling, has developed amongst those people who prefer bacon browned only slightly. In order to make sure that it is thoroughly cooked, the bacon is parboiled first.

BOOKS AND LITERATURE

Any book or periodical mentioned in this department may be obtained through the JOURNAL OF HOME ECONOMICS if the Journal price is listed.

Domestic Architecture. By L. EUGENE ROBINSON, New York: The Macmillan Company, 1917, pp. 378. $1.50. By mail of the Journal, $1.64.

This book presents, in a well organized form, many facts of practical significance, which teachers of House Planning have been compelled to gather from many sources. The method of organizing the material is especially suited to high school classes. The chapters are divided into clearly indicated subtopics, which are summarized at the end of each chapter by sketch problems and a bibliography relating to their solution.

For use in college classes, as reference material, there is need of an addition to the book, in the form a of list of illustrations. The illustrations are a most valuable feature of the book. Through them the author demonstrates the influence of practical processes and conditions upon the principles of design.

The book is divided into two parts. Part one deals with the usual problems of House Planning in an unusually clear manner. Among the topics here included may be mentioned common Building Materials, Finish Building Materials, House Construction, Appliances, Heating and Ventilating, Lighting, Plumbing, and Cost of Dwellings. Part two is a practical guide for house design, including a Drafting-room Manual, Problems in Design, and a most excellent Glossary of Architectural Terms.

From the teacher's view point, this book is a most welcome contribution.

ETHELWYN MILLER.

University of Chicago.

Food for the Worker. The food values and cost of a series of menus and recipes for seven weeks. By FRANCES STERN and GERTRUDE T. SFITZ. Boston: Whitcomb and Barrows, 1917, pp. 131. 1 diagram. $1.00. By mail of the Journal, $1.08.

By what extraordinary combination of circumstances has it come about that we think of "food for the worker" as necessarily plain, questionably complete, and as demanding more or less scheming and planning to make it supply all the needs of the body? Surely such a diet would be better suited to the idler or the laggard who has little need of energy or of strength of body, and plenty of time in which to turn and twist the pattern of the perfect diet, which instinct designed in the rough and the expert in nutrition has perfected so as to "get it out," as we say in dressmaking, from available food materials. Under existing conditions, illogical, inexpedient, and unjust as they are, it is often the worker who must experiment most with the pattern, turning it now this way and now that, and to him this book, the product of broad sympathies and of wide practical experience, is sure to be of value. It could hardly be better described than by Dr. Mendel in the foreword:

"The more I have investigated the difficulties under present-day conditions of securing adequate nutrition at an average cost of twenty cents per day per person, for the families of small earning capacity, the more have I been impressed with the immediate helpfulness of such essays. It matters little whether these dietaries are acceptable in

their entirety. The contribution of 147 menus carefully planned, with tested recipes which are the outcome of the direct experience of a visiting housekeeper under conditions that prevail in a large American city, is a valuable effort in a somewhat novel direction. Only one who has actually attempted, with restricted funds, to purchase a variety of abundant, suitable, seasonable foods in a retail market can thoroughly appreciate the situation."

It might be added that those who, in the present crisis, are trying to plan meals so as to do away with all waste will be glad of the opportunity which this book offers to get the food value of cooked dishes as well as of separate food materials. The carefully prepared recipes given in connection with the food values are also helpful. Those who lay down rules for diet in terms of protein, fat, and other nutrients often fail to realize how difficult it is for practical housekeepers to plan meals so that they will include popular dishes and at the same time have the right food value.

It was Mrs. Beeton, the famous English authority on household economy of two generations ago, who gave in her cook book directions for preparing a "soup for charitable purposes," the composition of which was doubtless determined by the author's estimate of the average gentlewoman's gifts to the poor. The nutritive value of the recipes in *Food for the Worker* is determined first by dietary standards and second by what the average unskilled laborer in a typical American city can pay on a pinch. That the result of the pinch must be an unfortunate cutting down of other items in the family budget is shown by the estimate on page 22. Here it is stated that the food recommended, plain as it is, would cost $364 a year in quantities sufficient for the average family. This is 69 per cent of $528, the income of a man who works at $2 a day without being laid off more than eight weeks in the year. There would be left $164 for rent and clothing and all the other necessaries and decencies of life. The inclusion of this statement makes the book an argument for an adjustment between wages and cost of living as well as a practical guide to the economical selection and preparation of foods.

That adjustment is vitally necessary has long been recognized by all those who have taken pains to compare wages and food prices. The only stumbling block has been its practicability. Now many powerful and influential people, setting lightly aside all possibility of failure, have set forth seriously on a program of food control. If control is possible in times of war, it is possible in times of peace; if it is desirable for the development of the arts of war, it is even more desirable in the interest of the arts of peace. The practicability of control demonstrated, the only question is about the amount of adjustment necessary, and in determining this, such books as *Food for the Worker* will surely be helpful.

CAROLINE L. HUNT.

Washington, D. C.

PAMPHLETS RECEIVED

The following bulletins may be obtained free from the Division of Publications, United States Department of Agriculture, Washington, D. C.:

Drying Fruits and Vegetables in the Home. Farmer's Bulletin 841.

Home Canning by the One-Period Cold-Pack Method. By O. H. Benson. Farmers' Bulletin 839.

Home Canning of Fruits and Vegetables. By Mary E. Cresswell and Ola Powell. Farmers' Bulletin 853.

How to Select Foods. II. Cereal Foods. By Caroline L. Hunt and Helen W. Atwater. Farmers' Bulletin 817.

The following bulletins are issued by the publishers listed:

Forty Ways of Reducing Food Bills. By Winifred Stuart Gibbs. Extension Department, Mechanics Institute, Rochester, N. Y. 10 cents.

Conservation of Foods. The Stout Institute Bulletin, Menomonie, Wis.

Ten Lessons on Food Conservation. Lessons 1 to V, Food Administration, Washington, D. C.

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Potatoes, Sweet Potatoes, and Other Starchy Roots as Food. C. F. Langworthy, *U. S. Dept. Agr. Bul.* 468 (1917), pp. 29, figs. 7.

Homemade Bread Substitutes for Diabetic Patients. R. T. Williamson, *Brit. Med. Jour.*, (1916), no. 2921, pp. 870, 871. Recipes are given.

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Milling and Baking Tests of Victorian Wheat. P. R. Scott and F. G. B. Winslow, *Jour. Dept. Agr. Victoria*, 14 (1916), no. 11, pp. 641–652, figs. 2.

The Nutritive Value of Wood. G. Haberlandt, *Sitzber. K. Preuss. Akad. Wiss.*, 1915, XIV, pp. 253–257; abs. in Expt. Sta. Rec., 36 (1917), no. 6, p. 561.

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[Food of the Natives of Mailu, British New Guinea]. B. Malinowski, *Trans. and Proc. Roy. Soc. So. Aust.*, 39 (1915), pp. 546–553, figs. 8. Information regarding the nature of the food, its preparation, and cooking.

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The Factors Which Determine the Adequacy of a Vegetable Diet. R. G. Pearce, *Jour. Lab. and Clin. Med.*, 2 (1917), no. 4, pp. 280–282.

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Studies of the Values of Different Grades of Milk in Infant Feeding. R. M. Washburn and C. H. Jones, *Vermont Sta. Bul.* 195 (1916), pp. 144, pls. 9, figs. 10.

The Influence of the Coagulation by Rennin upon the Gastric Digestion of Milk Protein. J. T. Leary and S. H. Sheib, *Jour. Biol. Chem.*, 28 (1917), no. 2, pp. 393–398.

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NEWS FROM THE FIELD

A Meeting of the Home Economics Extension Workers of the Western States was held at Logan, Utah, May 2, 3, 4. There was an excellent program, with helpful demonstrations, and valuable County Project reports. Nine out of the eleven Western States were represented by the State Leaders in Home Economics. The Extension Directors of Washington, Idaho, Wyoming, and Utah were also in attendance, while the States Relations Service was represented by Miss Florence E. Ward in charge of women's work, and Mr. C. A. Clinton, Assistant Chief, acting in place of Dr. True and Mr. C. B. Smith who were unable to be present on account of the war. It was voted unanimously to make the meeting an annual event.

Sanitary Commission to Russia. Dr. Henry Sherman a member of the Council of the American Home Economics Association, and one to whom not only as individuals but as an association we are greatly indebted, is a member of the Red Cross Sanitary Commission to Russia. Dr. Billings of Chicago is in charge of the Commission, and Dr. C. E. A. Winslow of Yale and Dr. George Whipple of Harvard are also members.

The object of the expedition is to offer American aid in caring for Russia's sick and wounded soldiers, in furnishing medical supplies, and in helping her sanitary officers. Much of the money contributed for the Red Cross fund will be spent abroad, and in order that it may be well spent commissions of experts will be sent in advance to various countries to advise as to its disposition. The expenses of the Commission to Russia are to be paid by a wealthy New York business man.

HOME ECONOMICS WORKERS IN WASHINGTON, D. C.

As the result of a Home Economics Conference called by Mr. Hoover in May, the following were appointed as a permanent Advisory Committee to work under Dr. R. L. Wilbur, President of Leland Stanford University, whom Mr. Hoover has appointed as head of the Food Conservation Division of the Food Administration: Miss Abby L. Marlatt, Chairman; Miss Josephine T. Berry, Dr. Alice Boughton, Mrs. Henrietta Calvin, Dr. C. F. Langworthy, Miss Isabel Ely Lord, Dr. Alonzo E. Taylor.

Advisory Members: Miss Catharine Mac Kay, Miss Martha Van Renesselaer, Miss Florence Ward.

Mrs. Alice P. Norton, Editor of the JOURNAL OF HOME ECONOMICS, is acting as Editorial Secretary for Home Economics in the office of the Food Conservation Section of the Food Administration. She was called to Washington by Mr. Hoover on July 18, and her services have been volunteered for a short time by the JOURNAL Board. She will carry on her work on the JOURNAL in addition to the new work.

Miss Abby Marlatt is acting for the summer as Director of the Home Economics Section, Division of Food Conservation of the Food Administration. Her work includes the viséing, for the Food Administration, of publicity material dealing with food; the preparation of articles and other publicity material; and the answering of questions that have been received from all over the country in regard to food conservation. She assisted in preparing the Ten Lessons on Food Conservation that have been sent out to the summer normal schools.

Miss Isabel Ely Lord, a member of the JOURNAL Board, spent three weeks of July organizing a working library for the use of the Food Conservation Section of the Food Administration.

Miss Alice Boughton who took her doctor's degree at Columbia University in June, is acting as head of the Elementary and Secondary Schools Department of the Food Conservation Section of the Food Administration.

Miss Alice Ravenhill has been made Professor of Household Economics at the State Agricultural College, Logan, Utah.

Dr. Andrews is working for the summer in the Office of Home Economics, United States Department of Agriculture, as a Specialist in Household Thrift.

Miss Emma Winslow is temporarily assisting in assembling new material for the Woman's Section of the Office of Extension Work North and West, States Relations Service. Part of the time she will be in the field, making observations of city organization work to be reported to the Extension Office.

Miss Mary Thurston, a graduate of Teachers College, who has been a community worker in Atlanta, Ga., is now acting as Home Demonstration Agent for the District of Columbia. Miss Thurston is the first person to be appointed for urban extension work. This work is under the direction of Miss Mary E. Cresswell, Office of Extension Work in the South, and Miss Florence E. Ward, Office of Extension Work North and West.

Notes. The Wisconsin Legislature has just enacted a law authorizing The Stout Institute authorities to establish four year courses for the preparation of teachers of the Household and Industrial Arts and to grant a B.S. Degree upon the completion of such courses. The bill carried an appropriation for additional laboratories and equipment for the new courses and for additional teachers.

The four year courses will be offered at the beginning of the school year in September.

Miss Helen M. Norris, who graduated in 1915 from the Mary Hemenway school of Household Arts of Framingham, Mass., State Normal School, has been appointed State leader of Boys' and Girls' Canning and Home Economics Clubs in Massachusetts, and has already begun her work.

Miss Jenny H. Snow, head of the Department of Home Economics, Chicago Normal College, and for some years Instructor in the School of Education, University of Chicago, has been appointed Supervisor of Household Arts in the Chicago Schools. This is one of the most important home economics positions in the country, and offers today especial opportunity for service.

Miss Francis Swain of Indiana University, is to succeed Miss Snow at the Chicago Normal College.

The experiments on jams and marmalade reported in the article on page 375 were conducted by Miss Dorothy Russell of the Normal Household Science Class at Pratt Institute, and used as the subject of her graduation thesis.